

CHRONOS

A Sparse Linear Algebra Library for HPC

Chronos is a collection of sparse linear algebra functions specifically designed for High Performance Computing.

Chronos allows for the iterative solution of **extreme size linear systems of equations and eigenproblems** arising from real world industrial and scientific applications. Designed as an object-oriented software to be embedded in other applications, it is able to run on several platforms, taking full advantage of manycore CPUs and GPU accelerators currently available on modern HPC systems.

Chronos increases the performance up to 20 times if compared with other CPUs library, and even much more using GPUs.

Who is intended for?

Chronos is ideal for those who experiences bottleneck (both in time or memory) in simulations, in particular due to the linear system solution, and want to take fully advantage of modern HPC supercomputers:

- ISV with proprietary scientific software
- Proprietary code developers in Energy, Oil&Gas, Automotive, etc. sector.
- Open-source (OpenFOAM, CodeAster, etc.) code users

>>> Interested in more general information?

Visit the Chronos Web Page: m3eweb.it/chronos/

>>> Interested in more technical and numerical information?

See the latest papers published in Scientific Journals:

- <https://arxiv.org/abs/2102.07417>
- <https://arxiv.org/abs/1902.01715>
- <https://arxiv.org/abs/2010.14175>

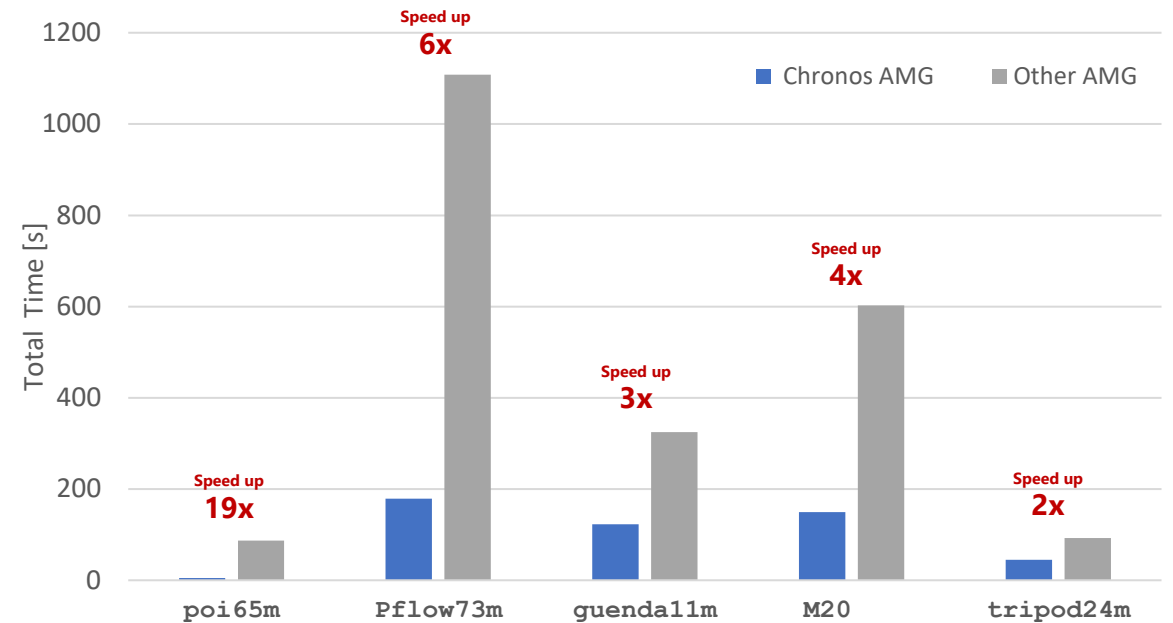


Figure: Total solution time of Chronos AMG compared to Boomer AMG from [Hypr package](#) (fluid dynamic simulation) or GAMG from [PETSc](#) (mechanical simulation)

>>> Interested in embedding Chronos in your applications?

Visit the Chronos User Manual: m3eweb.it/chronosdoc/usermanual/

>>> Would you like to compare Chronos with other numerical libraries?

Download for free some example matrices from our collection: m3eweb.it/matrixcollection/

>>> Would you like to evaluate the performance in your specific application?

Write an email to products@m3eweb.it and get a free license to test the library on your workstation or cluster.

Alternatively, send us a challenging matrix arising in your applications, and we will test Chronos for you, providing results and insights for optimal parameter tuning.